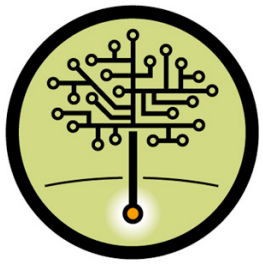
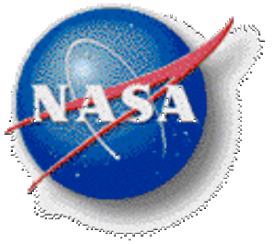


TAPROOT VENTURES



Working with NASA to Commercialize Technology: An Investor's Perspective

May 22, 2002

NASA's Commercialization Mantra: Is It Real?

NASA'S Overall Mission

"*To improve life here* . . . to extend life to there . . . And to find life beyond."

- Sean O'Keefe, NASA Administrator

NASA's Commercialization Mission

"Each NASA program will be carried out in a way that proactively involves the private sector from the onset, through a new way of doing business, to ensure that the technology developed will have maximum commercial potential"

Taproot Ventures' Experience Bears This Out:

- NASA's CTOs are actively searching for NASA inventions that can have an impact in the commercial world
- These offices understand industry/investor needs
- We find NASA to be rare among government agencies and universities in its real willingness AND capability to work with us: their goal isn't just licensing technology, it's getting technology to market

How to Benefit from NASA's Technology Focus

- **Finding technologies that solve your company's and the market's needs**
  - NASA is continually breaking new ground, developing freestanding inventions that might change an industry's landscape
  - NASA also develops technologies that might be incremental to your existing art
- **Unlocking value from your company's intellectual property**
  - Corporations routinely develop technology that goes unexploited, or that has broader application outside the corporation
- **Working with NASA as a Strategic Partner**
  - Taproot Ventures has developed a close relationship with several of the CTOs and Technology Centers at NASA
  - We work with them not only to source NASA technology, but in helping us validate and strategize regarding other technologies we're considering

NASA Technology: It's Not Just for Astronauts

Working with NASA, we've seen a tremendous amount of technology that has clear applications on Planet Earth

- Cutting-edge **nanotechnology** research, with near-term product applications in atomic force microscopy and semiconductor metrology, and long-term device applications in everything from chemical and biological sensors to flat-panel displays
- A new **deposition/coating technology** that produces very thin coats with greater uniformity and less harmful discharges than existing electroplating techniques
- A novel software algorithm and system for **routing airport ground transportation**, saving valuable time and increasing airport utilization
- Unique software **search engine** technology that operates more intuitively while improving accuracy of results

Commercializing Technology from NASA

- **NASA has adopted a proactive posture toward licensing technology to the commercial sector**
  - As a taxpayer supported entity, NASA prefers non-exclusive deals, but it will offer exclusivity when commercialization depends on it
  - NASA's interested in getting its technology into the economy; licensing fees and royalties are generally reasonable

- **Licensing/acquiring NASA technology includes:**
  - Complete technology disclosure and rights to the IP w/i a FOU
  - Coordinated and meaningful access to inventors
  - Startup perspective

- **We've seen several paths to exploiting NASA's technology prowess**
  - Licensing/acquiring technology fully cooked at NASA
  - Entering research agreement (several types) to extend technology

Technology Collaboration and Clearinghouse

- **For those with shelved or underutilized inventions they aren't exploiting, NASA can play a role in creating value for your organization**
  - Think of NASA when you're considering ways to further exploit internal R&D
- **If NASA researchers are interested, your technology can be used in further development work within NASA, under a Space Act Agreement (with IP ownership subject to negotiations)**
- **The Girvan Institute is a clearinghouse for technology, both internally and externally developed**
  - Your company's inventions might find interested buyers, or might be combined with other resident technologies in novel applications you had not considered
  - Girvan is an excellent conduit to entrepreneurial champions, service providers, venture capital
- **Examples we've seen:**
  - Novel coating technology brought to NASA; additional research and experimentation created spray-on circuits
  - Leading biotech company brought platform to NASA, received results of researchers' work to further technology's development
  - NASA-developed catalyst, licensed by entrepreneur, jointly developed with NASA for use in automobile catalytic converters

What do (Most) Venture Capital Firms Look For?

- **Attractive market**
  - Large and growing
  - No dominant players
- **Strong team**
  - Experienced with a track record of success
- **Key innovation resolves significant customer pain point**
  - Innovation provides a unique solution to an existing problem
  - The problem causes pain with financially significant consequences
  - Alternative – innovation creates a new market
- **Defensibility / sustainability**
  - IP is strong and broad
  - Other potential solutions to this problem are inferior
- **Clear path to revenues / profitability**
  - Targeting specific applications and specific customers
  - Quick adoption by early adopters
  - Ideally customer relationships and validation in place
- **Attractive valuation / equity structure**
  - Valuation expectations in line with market
  - Clean equity structure
- **Consistent with VC's strategy and niche**
  - VC's portfolio, relationships, or experience would help to accelerate the growth of this business
- **Viable exit options**
  - Sooner better than later
  - IPOs are great, but diversity of exit options is a plus

Additional Thoughts on Doing Business With NASA

- **Use your local Commercial Technology Office**
  - The CTOs are filled with people who want to see technology enter the market place (theirs and yours)
  - Suggested approach: educate the CT Officers about your technology needs. Let them dig for technology that can help
  - There is power in collaboration
- **Where to go to get started:**

Finding Technologies
- TechFinder: http://technology.nasa.gov
- CTOs: : http://technology.nasa.gov/nasa_resources/
- Regional Technology Transfer Centers

Resources for Working with NASA
- Your local CTO
- NASA Commercialization Technology Network http://nctn.hq.nasa.gov/
- Local NASA Incubators or Research Park